Chico
Golden Empire Amateur Radio Society, Inc.

“Dedicated to Public Service”

THE RADIATOR

W6RHC
IRLP #8170

www.gearsw6rhc.org
P.O.Box 202 Chico, CA 95927

September 2024 Newsletter	GEARS Founded August 13, 1939

As summer fades into fall we will still have plenty of time to enjoy the beautiful weather. A lot of ham operators are starting to enjoy portable operation. POTA (Parks On The Air) is one way, however there is no reason that you can’t just set up and operate almost anywhere. For more information on POTA see https://parksontheair.com

At our last GEARS meeting we discussed FT8. Kris Koenig KKØNIG demonstrated a portable FT8 setup out in the parking lot. Then Michael Favor N6FAV gave a detailed description of how to use FT8 back in the meeting room. I think most of us learned a lot. For more information on FT8, see the August GEARS Radiator newsletter.

In August GEARS also celebrated our 85th Anniversary at Kris’s Golden Beaver Distillery in Chico. We enjoyed barbecued hamburgers and a potluck.

Coming up on September 21st will be the Lincoln HamFest. See the flyer in this newsletter.

The next Chico ham radio breakfast will be on September 14th at our usual place, Farmers Skillet in Chico.

The next GEARS meeting will be on September 16th at the Chico Public Library. Topic will be a discussion of our local repeaters.

Remember that we now have the Win System operating on the GEARS UHF repeater at 440.650 MHz with plus offset, and a PL tone of 110.9 Hz. Listen in or give the system a try. Be sure to key up for a full second before speaking. For more information see www.winsystem.org/

‘73s
Jim Matthews K6EST

September 2024 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 8pm OARS Net	2 7pm GARS Net 8pm ARES Net 7pm GEARS Board meeting	3 7pm PARS Net 7:30pm GEARS Net	4	5 7:30pm Simplex Net	6	7
8 8pm OARS Net	9 7pm GARS Net 8pm ARES Net	10 7pm PARS Net 7:30pm GEARS Net	11	12 7:30pm Simplex Net	13 7pm OARS meeting 7pm GARS meeting	14 9am Chico Breakfast
15 8pm OARS Net	16 7pm GARS Net 8pm ARES Net 6pm GEARS Meeting	17 7pm PARS Net 7:30pm GEARS Net	18	19 7:30pm Simplex Net	20	21 HamFest Lincoln
22 8pm OARS Net	23 7pm GARS Net 8pm ARES Net	24 7pm PARS Net 7:30pm GEARS Net	25	26 7:30 Simplex Net	27	28 9am OARS Breakfast
29	30 7pm GARS Net 8pm ARES Net					

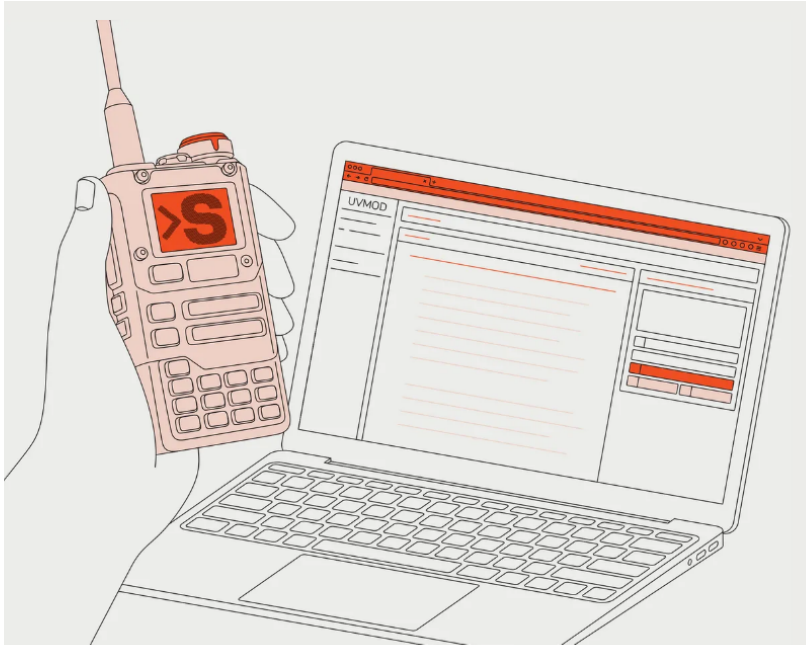
VEC Testing, FCC License Exam available by appointment. For information or registration call Tom Rider, W6JS 530-514-9211
Chico Breakfast 2nd Saturday 9am Farmers Skillet Cohasset Rd, Chico
GEARS Board Meeting 1st Monday 7pm by Google video meetups.
PARS Meeting 2nd Thursday 6:30pm, doors open 6pm Old Magalia Community Resource Center
OARS Meeting Second Friday of the month, St. Pauls Episcopal Church Hall, Oroville.
GARS Meeting Second Friday of the month, Lutheran Church Hall, Artois.
GEARS Meeting, Doors open 6pm, meeting 7pm at Chico Public Library, 1108 Sherman Ave, Chico
OARS Breakfast 4th Saturday of the month, at Cornucopia of Oroville.

NETS:
OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5
GARS Club Net Monday,7:00 pm 147.105 MHz + PL 110.09, secondary: 146.850 MHz-PL 110.9
Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3
GEARS Club Net Tuesdays 7:30 PM 146.850 MHz - PL 110.9
PARS Club Net Tuesday 7pm 145.290 - PL 110.9
Simplex Net Thursday 7:30 p.m. 146.52 no tone
Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3
Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

The Most Hackable Handheld Ham Radio Yet The UV-K5 can be modified at the click of a mouse

By Stephen Cass KB1WNR

You can add new features or upload your own boot screen to the UV-K5 radio with just a few clicks.



All right, confession time. I don’t use my handheld ham radio for much more than eavesdropping on the subway dispatcher when my train rumbles to a mysterious halt in a dark tunnel. But even I couldn’t help but hear the buzz surrounding a new handheld, Quansheng’s UV-K5.

It caught my attention in part because for over a decade, Baofeng has been the name in Chinese handhelds. In 2012 Baofeng made waves with its UV-5R radio, upending the sleepy handheld-transceiver market. Prior to the 5R, the price tag of the cheapest VHF/UHF handheld was a little north of US $100. The 5R sold for a quarter to a third of that. Hams groused about the 5R’s so-so technical performance—and then bought a couple anyway, so they’d always have a radio in their car or workplace.

Now it’s Quansheng that’s making a splash. The UV-K5, released last year, might be the most hackable handheld ever, with a small army of dedicated hams adding a raft of software-based improvements and new features. I had to have one, and $30 later, I did.

Like Baofeng’s 5R, Quansheng’s K5 as a radio transceiver is fine. (I’m using K5 here to refer to both the original K5 and the new K5(8) model.) The key technical distinction between the 5R and K5 is a seemingly minor design choice. With Baofeng’s 5R, the firmware resides in read-only memory. But Quansheng stores the K5’s firmware in flash memory and made it possible to rewrite that memory with the same USB programming cable used to assign frequencies to preset channels

This feature has opened the door for improvements to the K5 that are well beyond what Quansheng offers out of the box. Hopefully, this design will inspire other radio makers to offer more support for modders, in turn bringing more innovation to the VHF and UHF radio bands.

Quansheng probably thought of its design purely in terms of fixing software bugs or adjusting for regulatory changes—it offers a free install tool for uploading official firmware releases to the radio. But the prospect of an updatable radio dangled an irresistible temptation for folks to start reverse engineering the firmware and hardware so they could try writing their own code. Modifications to date have generally taken the form of patches to the official firmware, rather than wholesale rewrites. With the official firmware taking up most of the radio’s 64 kilobytes of flash memory, such mods have to fit into less than 3 KB. And the CPU is not brimming with compute power—it’s a 48-megahertz, 32-bit ARM-based processor with 8 KB of RAM. Nonetheless, I found the results impressive.

For example, one mod installs a fairly sophisticated graphical spectrum analyzer: You can adjust the bandwidth, set a threshold for tuning into detected peaks automatically, and specify frequencies to ignore, among other things. Another mod allows you to exchange text messages between K5s. Other mods improve the K5's ability to receive AM signals, meaning you can, say, listen in on aviation bands more clearly. And there are plenty of fun little mods that do things like change up the system fonts or replace the start-up message with a line-art image of your choice.

Updatable firmware dangled an irresistible temptation for folks to start reverse engineering…

Installing many of these mods is ridiculously easy. Normally at this point in a Hands On article that involves hacking some consumer electronics, things get pretty heroic as I futz with the hardware or unravel a software-installation enigma. But not this time.

A modder known as whosmatt has created a Web-based patcher/flasher for the K5 that lets you pick a selection of mods from a menu. It then combines them with the official firmware to create a custom image for uploading (as long as you don't exceed the total amount of memory).

In fact, if you're using Chrome, Edge, or Opera, you don't even need to use Quansheng's installer to upload the firmware: You can update the radio's flash memory directly from the browser via the built-in Web Serial API and the USB programming cable. (The instructions say this will work only on Linux and Windows, but I was able to do it using a Mac as well.) Web Serial could do with some improved error handling, though. The first USB programming cable I used was a bit flaky, but where Quansheng's installer would halt and flag a communications error with a failed upload, Web Serial would silently crash and take the whole Windows operating system with it.

There are even more K5 mods available than are in whosmatt's online patcher. If you want to play with those or start writing your own mods, Python-based toolchains exist to assist you.

Of course, allowing unfettered modding of the K5's transceiver does raise the possibility of abuse. For example, the Quansheng firmware blocks transmitting on the aviation band, to prevent illegal and hazardous interference. But this block can be removed by a patch (although to be a significant threat, you'd likely need an amplifier to boost the K5's 5-watt signal).

However, hams have always had the ability to behave badly, with or without firmware blocks. Such blocks are convenient for guarding against accidental abuse, but the truth is that unless problematic signals are persistent enough to allow a transmitter's location to be triangulated, amateur radio must continue to rely on an honor system, whether that means not jamming a neighbor's TV or transmitting on forbidden frequencies.

Many of the most exciting uses of ham radio today involve digital processing, and that processing is normally done using a computer connected to a transceiver. With embedded controllers becoming ever more powerful, the K5 modding scene points toward a future where more processing happens in-radio and where you can add new functions the way apps are added to smartphones. Here's hoping manufacturers embrace that future!

For more information see https://spectrum.ieee.org/quansheng-uv-k5-hacking

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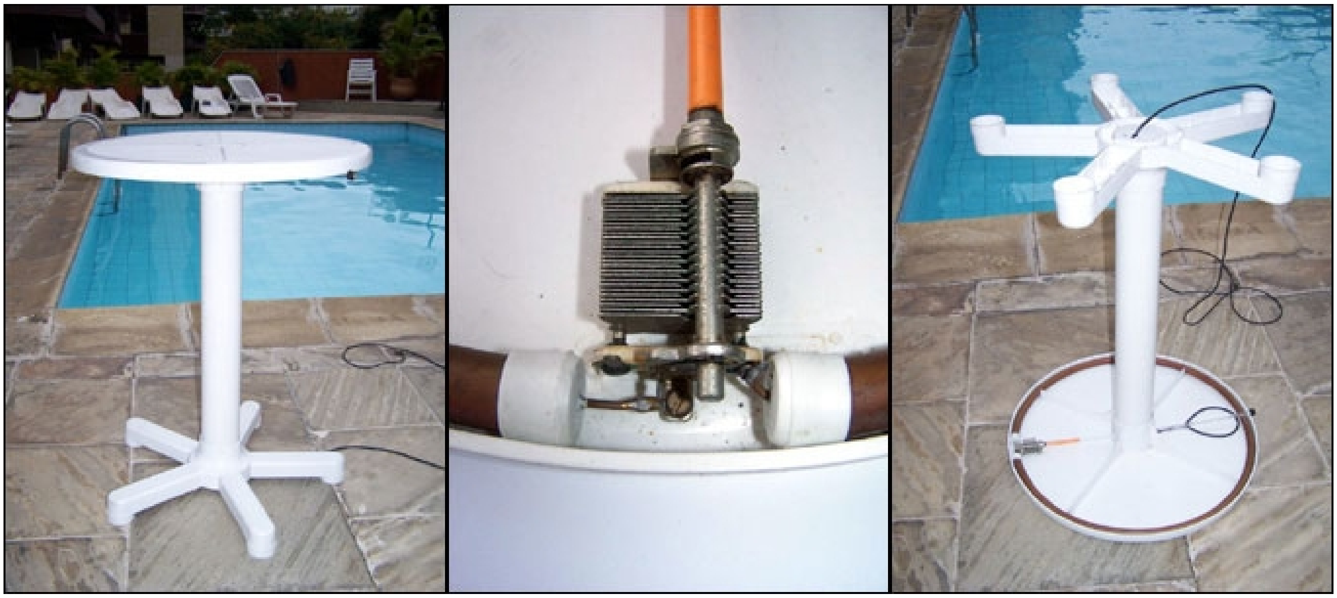
A Cleverly Concealed Magnetic Loop Antenna

by: Jenny List G7CKF

We're sure all radio amateurs must have encountered the problem faced by Alexandre Grimberg PY1AHD frequently enough that they nod their heads sagely. There you are, relaxing in the sun on the lounger next to the crystal-blue pool, and you fancy working a bit of DX. But the sheer horror of it all, a tower, rotator, and HF Yagi would ruin the aesthetic, so what can be done?



Alexandre's solution is simple and elegant: conceal a circular magnetic loop antenna beneath the rim of a circular plastic poolside table. Construction is the usual copper pipe with a co-axial coupling loop and a large air-gapped variable capacitor, and tuning comes via a long plastic rod that emerges as a discreet knob on the opposite side of the table. It has a 10 MHz to 30 MHz bandwidth, and should provide a decent antenna for such a small space. We can't help some concern about how easy to access that capacitor is, on these antennas there is induced a surprisingly large RF voltage across its vanes, and anyone unwary enough to sit at the table to enjoy a poolside drink might suffer a nasty RF burn to the knee. Perhaps we'd go for a remotely tuned model instead, for this reason.

Alexandre has many unusual loop projects under his belt, as well as producing commercial loops. Most interesting to us on his YouTube feed is this one with a capacitor formed from co-axial soft drink cans.

For more information see: https://hackaday.com/2018/06/23/a-cleverly-concealed-magnetic-loop-antenna/

Good News, GEARS t-shirts are now available anytime.

Cali Custom t-shirt shop in the Chico Mall (Marketplace) has our logo on file and can make a customized shirt for you. They can also do GEARS hoodies and other items.

Just go in and ask for what you want. The artwork is filed under GEARS.

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GEARS Newsletter edited by Jim Matthews K6EST

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Your dues and contributions support our local repeaters, ARES, Field Day and outreach events to keep amateur radio alive in our area. GEARS also makes donations to support other local repeaters and clubs.

GEARS Dues and Donations can be made online at
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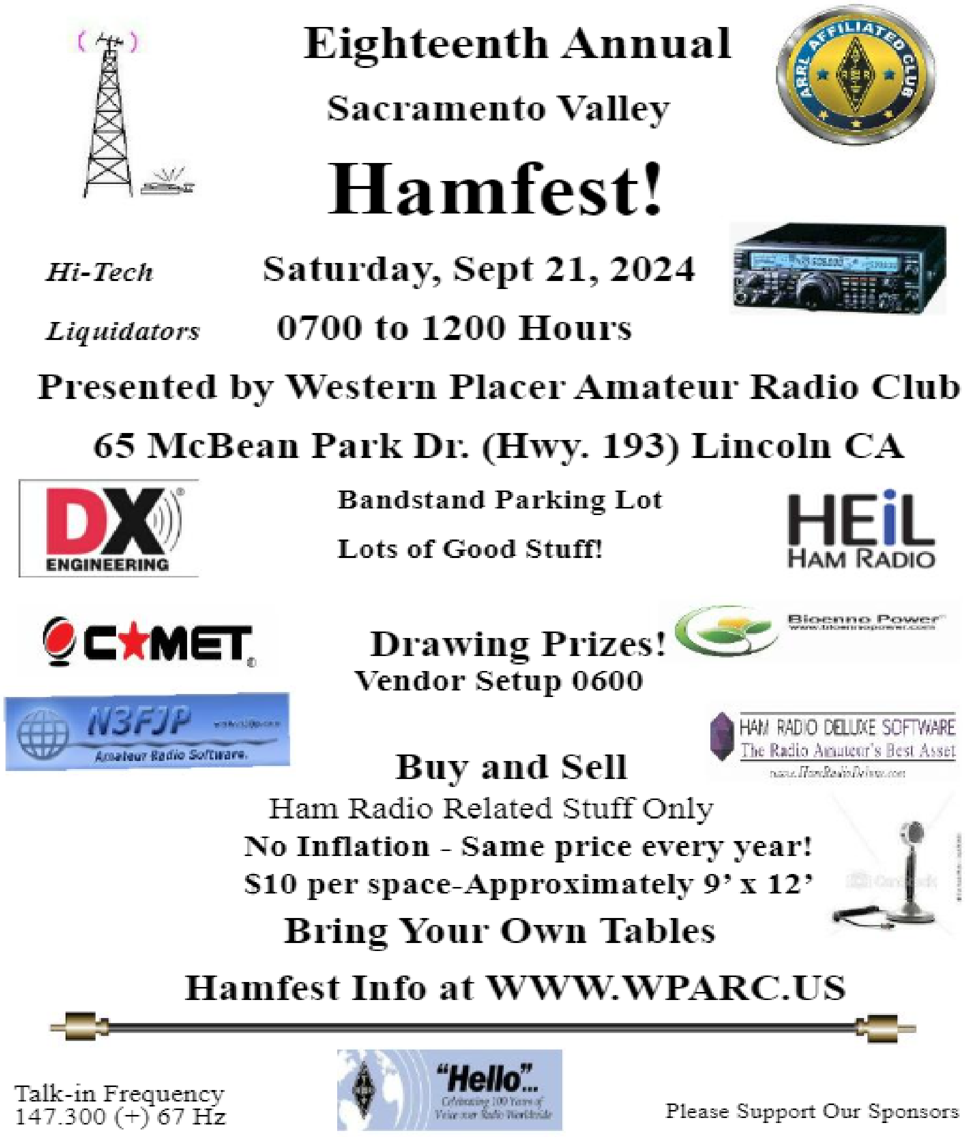

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65 McBean Park Dr. (Hwy. 193) Lincoln CA

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Hamfest Info at WWW.WPARC.US

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